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10/532,089	02/21/2006	Samuel Boutin	271254US2X PCT	8306

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EXAMINER	
PATEL, SHAMBHAVI K	

ART UNIT	PAPER NUMBER
2128	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/532,089	BOUTIN ET AL.	
	Examiner	Art Unit	
	SHAMBHAVI PATEL	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *38-48,50-75 and 77* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *38-48,50-75 and 77* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A **request for continued examination** under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/17/09 has been entered.

2. Claims 38-48 and 50-75 and 77 have been presented for examination. Claim 76 is cancelled and claim 77 is newly added.

Response to Arguments

3. In view of Applicant's amendments and arguments, the 35 U.S.C. 112 rejection is withdrawn.

4. Applicant's arguments have been fully considered but they are moot in view of the new grounds of rejection presented below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 38-48 and 50-75 and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cuatto ("A Case Study in Embedded Systems Design: An Engine Control Unit") in view of **Polis ("A Design Environment for Control-Based Embedded Systems").**

Regarding claim 38:

Cuatto discloses a method for designing a specification of a hardware and software system, comprising:

a. defining services, which are functions that can be performed, and for each service, at least one use case which is a context or situation that the system is in **(section 2nd-3rd paragraphs)**

b. associating, in the electrical architecture designing device, each use case with an initial state and a final state of the system **(section 2.1 1st paragraph: input, output)**

c. defining operations, in the course of which, for each state, a set of elementary operations are defined which correspond to a response for the system when said system is in said each state **(section 2.1 1st paragraph: transition function)**

d. specifying the system architecture by defining characteristics of electronic control units and networks **(section 3: electronic engine control unit, sensors networked to unit)**

e. mapping the elementary operations onto calculating units **(section 4.3: mapping behavior onto hardware and software),** including dividing a product to be mapped into a plurality of zones **(section 4.3: partitioning through performance simulation)**,and linking at least a first zone of the plurality of zones to a second zone of the plurality of zones **(section 4.3: system implemented partially in hardware and partially in software but simulated as a whole)**

f. executing at least one of: identifying flow of data circulating on the networks as a function of the mapping **(section 2.1: communication)** and identifying specifications associated with interfaces of the calculating unit as a function of the mapping **(section 2 1st paragraph: interface)**.

Cuatto does not explicitly disclose associating a user request with each use case and routing electrical wires between components of the specified system architecture of the product and linking the zones with connectors through which the routing of the electrical wires between the components pass. **Examiner notes** that Cuatto discloses mapping the system onto architecture using the Polis design environment, which is then simulated within the Ptolemy environment (i.e. performing co-simulation with Polis/Ptolemy) **(section 4.3). Polis (the user manual for the software used in the Cuatto reference) discloses** associating a user request with each use case **(section 2.2.1)** and that during a co-simulation with Polis/Ptolemy, the designer must route electrical wires between components of the specified system architecture of the product and link the zones with connectors through which the routing of the electrical wires between the components pass if the simulation is **(section 2.2.26: hardware to environment interfaces use a wire to carry the event presence information and a set of wires to carry the event value; section 6; section 6.1.2, page 55: Ptolemy requires creation of system galaxies; section 6.1.2, pages 57-58: creation of galaxies requires selection/creation of connectors and wires).** At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Cuatto and Polis because the steps disclosed in Polis are mandatory to the Cuatto simulation **(Polis: section 6; section 6.1.2, page 55: simulation in Ptolemy requires creation of system galaxies; section 6.1.2, pages 57-58: creation of galaxies requires selection/creation of connectors and wires).**

Regarding claim 39:

Cuatto discloses a method according to claim 38, wherein the mapping comprises, for each service, a choice among a plurality of mapping modes comprising: mapping the service onto a single calculating unit of the calculating units **(section 2 1st and 2nd paragraphs: mapping),** master-slave mapping, in which an elementary control operation that controls the single service activates, depending on a current state of the service in the system, mapping of elementary operations of the service onto one of the calculating units **(section 2 1st and 2nd paragraphs: mapping and transition function),** distributed mapping, in which the elementary operations are distributed over at least two calculating units **(section 2 1st and 2nd paragraphs: mapping)** and, onto each of the calculating units, the elementary control operation that controls the service is mapped and activates, depending on a current state of the service in the system, mapping of the elementary operations of the service onto the calculating units **(section 2.1 1st**

paragraph: transition function).

Regarding claim 40:

Cuatto and Polis teach a method according to claim 39, wherein the elementary control operations are generated automatically with: as inputs, all data necessary for calculation of transitions of a control automaton of the service and as an output, a datum representing the state in which the service finds itself **(Cuatto: section 2.1 1st paragraph: input, output, and transition function)**.and the transitions are transformations, via an elementary operation, of the user's requests **(Polis: section 2.2.1).**

Regarding claim 41:

Cuatto discloses a method according to claim 38, wherein, in the identifying data flows, a state of each data flow is determined relative to a given electronic messaging system **(section 2.1 1st paragraph: uses a globally asynchronous locally synchronous communication semantics input, output, and transition function; figure 1: levels of hierarchy)**

Regarding claim 42:

Cuatto discloses a method according to claim 38, wherein, given a use case, a performance constraint is imposed on the use case and on certain of the elementary operations executed in the initial state of the use case **(section 2 2nd paragraph: performance constraint)**, a list of those executions of elementary operations, executions of software and hardware drivers, writes and reads in the data frames, taking into account of information by sensors and actuators, and data frame transfer to a network that are implemented following mapping of the elementary operations is then automatically synthesized **(section 3: drivers, sensors, actuators, sensors networked to unit; section 4.3: partitioned behavior onto hardware and software)**, requirements of delay of execution and/or of response time of transmission, the reading and writing of the data frames, and execution of the drivers and of the elementary operations are then specified, response times of the sensors and the actuators are indicated **(section 2.1: reaction time; section 4.3 timing constraint)**, a fact that a performance constraint is satisfied for a mapping of the elementary operations is validated or requirements of delay of execution and/or of response time to satisfy the

performance constraint are specified **(section 4.2: simulation output)**.

Regarding claim 43:

Cuatto discloses a method according to claim 38, wherein if, for a service that has at least two variants, and the at least two variants have shared elementary operations, then the elementary operations are automatically mapped onto the same calculating units during mapping of one of the variants **(section 2.1: shared resources)**.

Regarding claim 44:

Cuatto discloses a device for design of a specification of a hardware and software system, comprising:

a. means for defining services which are functions that can be performed, and for each service, at least one use case which is a context or situation that the system is in **(section 2nd and 3rd paragraphs)**

b. means for associating each use case with an initial state and a final state of the system **(section 2.1 1st paragraph: input, output)**

c. means for defining operations, in the course of which, for each state, a set of elementary operations are defined which correspond to a response for the system when said system is in said each state **(section 2.1 1st paragraph: transition function)**

d. means for specifying the system architecture by defining characteristics of electronic control units and networks **(section 3: electronic engine control unit, sensors networked to unit)**

e. means for the elementary operations onto calculating units **(section 4.3: partitioned behavior onto hardware and software)** including dividing a product to be mapped into a plurality of zones **(section 4.3: partitioning through performance simulation)**,and linking at least a first zone of the plurality of zones to a second zone of the plurality of zones **(section 4.3: system implemented partially in hardware and partially in software but simulated as a whole)**

f. and at least one of: means for executing at least one of: identifying flow of data circulating on the networks as a function of the mapping **(section 2.1: communication)** and identifying specifications associated with interfaces of the calculating unit as a function of the mapping **(section 2 1st paragraph: interface)**

Cuatto does not explicitly disclose associating a user request with each use case and routing electrical wires between components of the specified system architecture of the product and linking the zones with connectors through which the routing of the electrical wires between the components pass. **Examiner notes** that Cuatto discloses mapping the system onto architecture using the Polis design environment, which is then simulated within the Ptolemy environment (i.e. performing co-simulation with Polis/Ptolemy) **(section 4.3)**. **Polis (the user manual for the software used in the Cuatto reference) discloses** associating a user request with each use case **(section 2.2.1)** and that during a co-simulation with Polis/Ptolemy, the designer must route electrical wires between components of the specified system architecture of the product and link the zones with connectors through which the routing of the electrical wires between the components pass if the simulation is **(section 2.2.26: hardware to environment interfaces use a wire to carry the event presence information and a set of wires to carry the event value; section 6; section 6.1.2, page 55: Ptolemy requires creation of system galaxies; section 6.1.2, pages 57-58: creation of galaxies requires selection/creation of connectors and wires)**. At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Cuatto and Polis because the steps disclosed in Polis are mandatory to the Cuatto simulation **(Polis: section 6; section 6.1.2, page 55: simulation in Ptolemy requires creation of system galaxies; section 6.1.2, pages 57-58: creation of galaxies requires selection/creation of connectors and wires).**

Regarding claim 45:

Cuatto discloses a device according to claim 44, further comprising means for selecting a hierarchical description, selection of each selection means causing a different screen of the device to appear **(figures 1 and 2)**.

Regarding claim 46:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, the hierarchical description represents, at a first level of hierarchy, a plurality of services and, at a second level of hierarchy, a plurality of use cases for each service **(figures 1 and 2: services and use case)**.

Regarding claim 47:

Polis teaches a device according to claim 46, wherein, for at least one screen, each use case comprises an initial context or situation of the system, a user's request to the system, and a response of the system corresponding to a change of a state of the system **(section 2.2.1)**.

Regarding claim 48:

Cuatto discloses a device according to claim 46, wherein, in at least one screen, states and associated state transitions are defined for each use case of a service **(figure 2: state and transition)**.

Regarding claim 50:

Cuatto discloses a device according to claim 44, wherein each phase is composed of a set of combinations of modes of operation of a vehicle, and the modes are not directly controlled by the response of the system to the services associated with the user request **(section 4.1: function blocks; Polis: 2.2.1)**.

Regarding claim 51:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, the hierarchical description represents a plurality of services at a first level of hierarchy and represents phases of the service at a second level of hierarchy **(figure 2: functional mode)**.

Regarding claim 52:

Cuatto discloses a device according to claim 47, wherein, for at least one screen, the hierarchical description represents a plurality of services at a first level of hierarchy and of states of the service at a second level of hierarchy **(figure 2: functional mode)**.

Regarding claim 53:

Cuatto discloses a device according to claim 51, wherein, within the hierarchical description, a hierarchical level in a given state describes the elementary operations **(figure 1: operation).**

Regarding claim 54:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, mapping of elementary operations onto components represented in a representational view is affected **(figure 1: view).**

Regarding claim 55:

Cuatto discloses a device according to claim 54, containing, for at least one screen, a representational view representing an envelope of a component and each elementary operation that the component controls or instructs **(figure 1: partitioning).**

Regarding claim 56:

Cuatto discloses a device according to claim 45, containing, for at least one screen, a representational view representing an envelope of a service and each elementary operation that the service comprises **(figures 3 and 4: envelope and elementary operation).**

Regarding claim 57:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, at a first level of hierarchy, the hierarchical description represents the calculating units of the system and, at a second level of hierarchy, elementary operations electronically monitored or controlled by each calculating unit **(figure 1: calculator and operation)**.

Regarding claim 58:

Cuatto discloses a device according to claim 57, wherein, for each screen, a hierarchical level represents, for each calculating unit, the services that are mapped at least partly onto the calculating unit **(figure 1: service)**.

Regarding claim 59:

Cuatto discloses a device according to claim 57, wherein, for each screen, a representational view represents, for each calculating unit, the modes in which the calculating units must function **(figure 2: mode)**.

Regarding claim 60:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, a representational view represents at least one network and the components connected to it **(figure 2: view).**

Regarding claim 61:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, at a first level of hierarchy, the hierarchical description represents the calculating units of the system and, at a second level of hierarchy, for each calculating unit, data frames are transported on buses to which the calculating unit and/or the components directly connected to the calculating units are connected **(section 2.1 modeling of shared resources)**.

Regarding claim 62:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, the hierarchical description represents frames at a first level of hierarchy and, at a second level of hierarchy, for each frame of the frames, the data contained in the frames **(figure 3: data).**

Regarding claim 63:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, a representational view represents components and/or networks and a projection of a service onto the components and/or networks **(figure 1: service)**.

Regarding claim 64:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, a hierarchical level describes, for each elementary operation, input and output interface data flows, and, for each data flow, a driver and the component and/or the elementary operation with which the data flow is exchanged **(figures 2 and 3)**.

Regarding claim 65:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, the hierarchical description represents, at a first level of hierarchy, a plurality of services and, at a second level of hierarchy, a plurality of service variants, for each service **(figure 3: service and variant).**

Regarding claim 66:

Cuatto discloses a device according to claim 45, wherein, for at least one screen, the hierarchical description represents, at a first level of hierarchy, a plurality of electronic components and, at a second level of hierarchy, a plurality of similar electronic components, for each electronic component **(figures 3 and 4: component and variant)**.

Regarding claim 67:

Cuatto discloses a device according to claim 45, wherein, for at least one representational view, a selection of an element of the representational view by a pointing device gives access to a representation of the functioning of the element **(sections 4.1 and 4.2: hierarchical models)**.

Regarding claim 68:

Cuatto discloses a device according to claim 44, wherein, for a use case, given partial or complete mapping of the services, the set of elementary operations in the architecture and the set of data exchanged corresponding to execution of the use case are automatically identified **(section 4.3: partitioned behavior onto hardware and software)**.

Regarding claim 69:

Cuatto discloses a device according to claim 44, wherein, for a use case, if a performance constraint is imposed on the use case **(section 2 2nd paragraph: performance constraint)**, the set of elementary operations in the architecture, a set of exchanged data frames, and a set of sensors necessary and/or a set of actuators activated are automatically identified **(section 3: drivers, sensors, actuators, sensors networked to unit; section 4.3: partitioned behavior onto hardware and software)**, in such a manner as to assign respectively thereto specific constraints of delay of execution, of delay of transmission, of delay of activation, and/or to validate the constraints already imposed **(section 2.1: reaction time; section 4.3 timing constraint)**.

Regarding claim 70:

Cuatto discloses a device according to claim 44, further comprising, for objects, hardware components and/or services offered to the client, a graphic representation comprising: a contour representing the object, representations of other objects with which the object communicates, and representations of data exchanged with the other objects **(figure 3: object, communication and data)**.

Regarding claim 71:

Cuatto discloses a device according to claim 70, wherein, when the envelope represents a hardware component, data representations are effected for a service **(figures 3 and 4: hardware and service)**.

Regarding claim 72:

Cuatto discloses a device according to claim 44, further comprising, for each bus, a representation of components that are connected directly thereto and, for components directly connected to at least two buses, for each of these at least two buses, associated with the component, an identifier of each other bus to which the component is directly connected **(section 2.1 modeling of shared resources)**.

Regarding claim 73:

Cuatto discloses a device according to claim 72, wherein the identifier is a graphical element **(figures 3 and 4)**.

Regarding claim 74:

Cuatto discloses a manufactured article comprising: a computer storage means having a computer program for designing a specification of a hardware and software system, wherein the program comprises a code for execution of the method defined in claim 38 **(Introduction).**

Regarding claim 75:

Cuatto discloses a method according to claim 38, wherein the hardware and software system is related to a vehicle **(section 3: engine control unit of a automobile).**

Regarding claim 77:

Cuatto and Polis disclose defining a prohibited subzone within at least one of the plurality of zones such that the routing is not allowed to pass through the prohibited subzone **(Cuatto: figure 5: connects don't go through actual components themselves; Polis: connections occur at particular terminals).**

Conclusion

6. Examiner's Remarks: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner. In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shambhavi Patel whose telephone number is (571) 272-5877. The examiner can normally be reached on Monday-Friday, 8:00 am – 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571) 272-2279. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKP

/Kamini S Shah/
Supervisory Patent Examiner, Art Unit 2128